

**EXAMINER'S AMENDMENT**

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Ryan Carter on August 9, 2010.

The application has been amended as follows:

Please amend claims 122, 198, and 225 as follows:

122. The process of claim 77, further comprising adjusting the pH of the glycerin rich stream by adding an acid solution thereto.

198. A process for the production of purified biodiesel from a feedstock containing at least one fatty acid, the process comprising:

(A) converting the at least one fatty acid in the feedstock to a glyceride;

(B) reacting the glyceride with at least one alcohol to produce a fatty acid alkyl ester wherein the reaction is conducted in a transesterification reactor and further wherein the at least one alcohol is added to the transesterification reactor at a rate that is greater than the stoichiometric amount of alcohol required for transesterification; and

(C) separating the product of step (B) into a fatty acid alkyl ester rich stream and a glycerin rich stream; and

(D) purifying the fatty acid alkyl ester rich stream by distillation or fractionation to produce purified biodiesel having an acid number less than or equal to 0.80 mg KOH/g and total glycerin less than or equal to 0.240% mass without subjecting the fatty acid alkyl ester rich stream to water washing;

wherein step (A) comprises mixing the feedstock with glycerin for a time sufficient to convert the at least one fatty acid in the feedstock to a glyceride; wherein the feedstock and glycerin are reacted in at least two continuous stirred tank reactors.

225. A process for the production of purified biodiesel from a feedstock containing at least one fatty acid, the process comprising:

(A) converting the at least one fatty acid in the feedstock to a glyceride;

(B) reacting the glyceride with at least one alcohol to produce a fatty acid alkyl ester wherein the reaction is conducted in a transesterification reactor and further wherein the at least one alcohol is added to the transesterification reactor at a rate that is greater than the stoichiometric amount of alcohol required for transesterification; and

(C) separating the product of step (B) into a fatty acid alkyl ester rich stream and a glycerin rich stream; and

(D) purifying the fatty acid alkyl ester rich stream by distillation or fractionation to produce purified biodiesel having an acid number less than or equal to 0.80 mg KOH/g and total glycerin less than or equal to 0.240% mass without subjecting the fatty acid alkyl ester rich stream to water washing; wherein the purified biodiesel produced in step (D) meets ASTM specification D 6751.

2. The following is an examiner's statement of reasons for allowance: The prior art of record does not appear to anticipate or render obvious the limitation precluding water washing of the fatty acid alkyl ester rich stream. The prior Office action asserted that the claimed invention was unpatentable over van Loon (US 2588435) in view of Kenneally et al (WO 99/24387 or US 6965043). However, both van Loon and Kenneally et al teach water washing [see column 3, lines 23-27 & column 4, lines 49-51 of van Loon and column 6, lines 17-63 of Kenneally et al '043]. Indeed, it appears that water washing is typically an important step in the process prior to distillation because the

Art Unit: 1797

washing allows for better phase separation and greater removal of glycerin (or glycerol) from the ester [see, e.g., column 6, lines 17-24 of Kenneally et al '043] since it is soluble in water and more dense than water (specific gravity is approximately 1.2) and much more dense than the typical ester products of the claimed invention, which have specific gravities ranging from 0.87 to 0.89 and are not soluble in water [see Table I of Gouw et al in *The Journal of the American Oil Chemists' Society* (1964, vol 41, pgs 142-145). Therefore, physical separation by water washing improves separation of the glycerin, which has a normal boiling point of 290° C (563 K), from the ester products of the claimed invention, which have a normal boiling point range from 535 to about 690 K [see Table 3 of Yuan et al in *Fuel* (2005, vol 84, pgs 943-950) from C<sub>12</sub> to C<sub>24</sub>] because separation by distillation would be problematic due to the overlapping boiling point ranges.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BRIAN MCCAIG whose telephone number is (571) 270-5548. The examiner can normally be reached on M-F 8-430.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1797

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BAM  
8/11/2010

/ROBERT J. HILL, JR/  
Primary Examiner, Art Unit 1797